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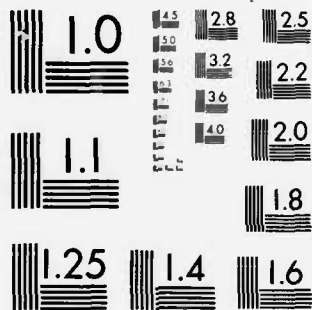
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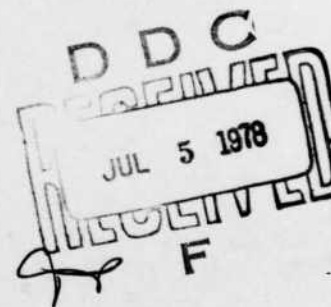
Refuse-Collection Scheduling For Selected Locations

Volume II: Hill Air Force Base, Utah

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NOVEMBER 1977

FINAL REPORT FOR PERIOD JANUARY 1976-APRIL 1977

Approved for public release; distribution unlimited

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE

(AIR FORCE SYSTEMS COMMAND)

TYNDALL AIR FORCE BASE
FLORIDA 32403

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This report presents maps and schedules produced by the Air Force Refuse-Collection Scheduling Program for residential refuse collection at Hill Air Force Base, Utah. The data required for scheduling are discussed briefly. The computer-generated schedule reduced the number of trips from 4 to 3 and the total mileage from 53.4 to 44.5 miles.		

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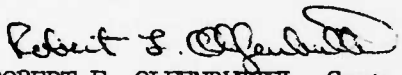
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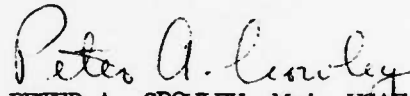
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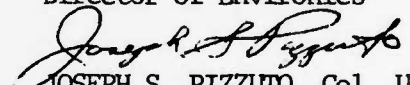
This report has been reviewed by the Information Officer and is releasable to the National Technical Information Service (NTIS). At NTIS it will be available to the general public, including foreign nations.

This technical report has been reviewed and is approved for publication.


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SECTION I INTRODUCTION

BACKGROUND

From 1973 through 1975, a study was conducted at the Civil Engineering Research Facility (CERF) to evaluate the usefulness of the IBM Vehicle Scheduling Program for scheduling refuse collection at Air Force bases. This study indicated that reductions in manpower and total mileage of up to 20 percent could be obtained in some cases. The large amount of human effort required to put the routes produced by the IBM program in a useable form led to the development of the CERF Refuse-Collection Scheduling Program (RCSP). This program produces a printed schedule and maps that can be used, without modification, by the driver of the collection vehicle or in reports.

OBJECTIVE

The objective of this effort was to use RCSP to determine optimum refuse-collection schedules for four Air Force bases. These test bases provide enough variety in refuse-scheduling problems to allow a determination of the program's range of applicability and, ultimately, an evaluation of its potential for use on all Air Force bases.

SCOPE

This report presents the results obtained when RCSP was used to schedule refuse collection at Hill Air Force Base, Utah. The data required for scheduling are described briefly. The original and new schedules are compared. Since the new schedule requires only three collection trips, while the original required four, a procedure for verifying and implementing the new schedule is given. The original and the computer-generated routes are presented on maps and as printed schedules.

SECTION II DATA REQUIREMENTS

The data available for Hill Air Force Base included three maps, one showing the entire base with the path to Davis landfill sketched in, and the other two showing enlargements of the housing areas. The original routes were marked on the maps. In addition to the maps, the following information was provided:

1. unloading time at the landfill is 10 minutes,
2. speed of the refuse vehicles is 25 miles per hour on base,
3. one 16-cubic-yard vehicle services 100 houses,
4. distance from the main gate to Davis landfill is 3.2 miles traveled at 40 miles per hour,
5. the collection vehicle travels at 5 miles per hour in the housing area, and
6. the vehicle averages 40 seconds per stop.

Speed limits were treated in the following manner. Highway 193 was assigned a speed limit of 50 miles per hour. All other off-base roads were assigned speed limits of 40 miles per hour. All on-base roads outside of housing areas were assigned speed limits of 25 miles per hour. All streets within housing areas were assigned speed limits of 15 miles per hour.

Four routes were indicated on the maps. To obtain computer-generated maps and a schedule for these original routes, information describing the routes was used as input to program PHASE4. The schedule and maps thus obtained are presented in Appendixes A and B.

The computer-generated original schedule indicated that 300 families, not 100 as indicated in the information provided by the base, could be serviced on one trip. The 300-family capacity was selected for use in RCSP.

The route summary for the original routes indicated a total of 870 collection points. Of these, 520 represented families living outside the Wherry housing area and 350 represented individuals living in the Wherry area. (The route summary in Appendix A lists only 346 housing units for the Wherry area because the paths to four of the units were not shown on the original maps.)

With a vehicle capacity of 300 families, the 870 collection points could be serviced in three trips. Each Wherry housing unit was treated as 0.75 households; thus, the total refuse quantity for that area was counted as 262.5 households. Vehicle capacity was set at 270 households, allowing all refuse to be collected in three trips, one of them covering the Wherry housing area and the other two servicing the remainder of the base.

RCSP consists of four computer programs: the data-checking program (RCINPT), the section-assignment program (PHASE2), the route-traversing program (PHASE3), and the route-map and schedule-generating program (PHASE4).

The RCINPT data consist of seven records: street names, size of output map, and five records describing input maps. The third record describes the overall map without providing any details of the housing areas. Records four through seven are descriptions of housing areas. The actual data cards for Hill Air Force Base are listed in Appendix C.

Data for PHASE2 consist of only four cards: a title card, the vehicle-capacity card, the time-limits card, and an output-map size card. The data cards for Hill Air Force Base are as follows:

HILL AFB						
	270.					
.667		10.	4.5			
0.	6.1	15.25	2.	12.	25.	10.

The required input data to PHASE3 consist of only two cards: a title card and a card giving the node numbers assigned to the landfill and the garage. Five optional cards were added, each reassigning a street segment to another section (sections correspond to trips). These data cards are as follows for Hill Air Force Base:

HILL AFB, UTAH	
1040	5
182	3
167	3
171	3
155	2
156	2

The five segment reassignments were made to improve the schedule. In three cases, the close approximation of street shapes had caused segments of a single street to be assigned to different collection trips. If a coarser shape approximation had been used, these streets would have been shown as single segments, and the problem would not have arisen. The reassignments eliminated the need to use two trucks to service a single street. The other two segments were reassigned because the original assignment required the collection vehicle to travel them twice. The new assignment requires only one trip over these segments.

The three data records for PHASE4 are listed in Appendix D. The first record consists of a title card, a card giving the unit-of-refuse measurement, two time-limits cards, and a vehicle-identification card. The second record consists of cards specifying map boundaries. The third record consists of cards describing the paths in each of the routes. Normally, this information is passed from program PHASE3 to PHASE4 on disk or tape, but since some changes were desired in the final routes, the data were punched onto cards, modified, and included as card input to program PHASE4. The changes in the routes were of two types: minor changes in the direction of traversal for some loops and major changes to correct for improper traversal direction on one-way streets. Since E street has a median, it should have been treated as two one-way streets, but an inadequacy in PHASE3 made it necessary to treat E street as two two-way streets. The resulting wrong-direction travel was corrected on the path data cards to PHASE4.

SECTION III

EVALUATION OF COMPUTER-GENERATED SCHEDULE

The original refuse-collection schedule for Hill Air Force Base required four trips covering 53.4 miles to service all of the houses. The computer-generated schedule requires only three trips and covers 44.5 miles. Thus the computer-generated schedule decreases total mileage by 17 percent and number of trips by 25 percent. The heaviest collection trip in the old schedule serviced 300 households, whereas the heaviest trip in the new schedule services 265, a reduction of about 12 percent. In either schedule, the Wherry housing area is serviced in one trip. The computer-generated schedule is given in Appendix E, and the corresponding maps are presented in Appendix F.

SECTION IV IMPLEMENTATION REQUIREMENTS

RCSP assumes that any two collection vehicles of the same capacity could service the same number of households. Therefore, the two most important preliminary verifications are that 1) the maximum number of households serviced on one trip has been correctly determined and 2) the vehicle involved is almost always capable of completing its route without overfilling. For Hill Air Force Base, the heaviest collection trip is labeled ROUTE2 in the original schedule (Appendix A). In the routes produced by RCSP, the heaviest trip services 265 households, so it need only be verified that at least 265 households are serviced by what is currently the largest-capacity trip. Even if considerably more than 265 households are actually serviced, there should be no problem with the vehicle overfilling because it is capable of servicing 300 households. If none of the current trips service at least 265 households, the Air Force Civil and Environmental Engineering Development Office should be given corrected route information so the capacity can be determined accurately and the program rerun. If the trip described as ROUTE2 does service approximately 300 households, then the new schedule in Appendix E and the maps in Appendix F will be suitable for implementation.

If the scheduling is under Air Force control, the new maps and schedules may be given to the person in charge of scheduling. If a contractor is responsible for scheduling and refuse collection, the new maps and schedules may be given to him; the savings in mileage and number of trips should provide incentive for implementation. When the refuse-collection contract goes out for open bidding, distribution of the computer-generated schedule may produce lower cost estimates.

APPENDIX A

ORIGINAL ROUTE SCHEDULE

FINAL ROUTE SUMMARY HILL AFB, UTAH

ROUTE	VEHICLE IDENTIFICATION	VEHICLE CAPACITY (HOUSEHOLDS)	SECTION(S) TRIP1 TRIP2	DISTANCE (MILES)	TIME (H:MM)	HOUSEHOLDS SERVICED (HOUSEHOLDS)	REFUSE QUANTITY (HOUSEHOLDS)
1	16 CU YD VEHICLE	270.0	1	13.5	4:47	346	259.5
2	16 CU YD VEHICLE	270.0	2	12.5	4:19	298	298.0
3	16 CU YD VEHICLE	270.0	3	12.2	3:02	194	194.0
4	16 CU YD VEHICLE	270.0	4	15.1	1:04	26	26.0
TOTALS				53.4	13:12	864	777.5

ROUTE 1	HILL AFB, UTAH	16 CU YO VEHICLE	SPEED (MPH)	TIME (H:MM:SS)	DISTANCE (MILES)	HOUSEHOLDS SERVICED	LCAD (PCT)
ACTION							
LEAVE GARAGE							
DRIVE ON	2ND ST	TO 2ND ST	25	8:00			
DRIVE ON	SOUTHWGATE OR	TO SOUTHWGATE OR	25	8:00	.1		
DRIVE ON	11TH ST	TO 11TH ST	25	8:01	.2		
DRIVE ON	PERIMETER RD	TO PERIMETER RD	25	8:03	.8		
DRIVE ON	WHERRY RD	TO WHERRY RD	25	8:03	.1		
DRIVE ON	6TH ST	TO 6TH ST	25	8:05	1.0		
DRIVE ON	6TH ST	TO 6TH ST	25	8:06	.3		
DRIVE ON	6TH ST	TO 6TH ST	15	8:06	.1		
PICK LP ON BOTH SIDES	6TH ST	TO VAMPIRE ST	5	8:09	.0	4	1
PICK LP ON BOTH SIDES	VAMPIRE ST	TO 4TH ST	5	8:14	.0	6	2
PICK LP ON BOTH SIDES	VAMPIRE ST	TO 4TH ST	5	8:30	.0	24	9
PICK LP ON BOTH SIDES	VAMPIRE ST	TO 4TH ST	5	8:44	.1	20	14
PICK LP ON BOTH SIDES	VAMPIRE ST	TO 4TH ST	5	8:58	.0	20	20
PICK LP ON BOTH SIDES	VAMPIRE ST	TO 4TH ST	5	9:01	.0	4	21
DRIVE ON	4TH ST	TO 4TH ST	15	9:01	.0		
PICK LP ON BOTH SIDES	4TH ST	TO 4TH ST	5	9:16	.1	20	21
DRIVE ON	4TH ST	TO VALIANT ST	15	9:16	.1		
DRIVE ON	4TH ST	TO VALIANT ST	15	9:16	.0		
PICK LP ON BOTH SIDES	VALIANT ST	TO 4TH ST	5	9:24	.0	10	27
PICK LP ON BOTH SIDES	VALIANT ST	TO 4TH ST	5	9:27	.0	4	29
DRIVE ON	4TH ST	TO 4TH ST	15	9:27	.0		
PICK LP ON BOTH SIDES	4TH ST	TO 4TH ST	5	9:34	.1	10	31
PICK LP ON BOTH SIDES	4TH ST	TO 4TH ST	5	9:40	.1	8	33
DRIVE ON	4TH ST	TO VALIANT ST	15	9:40	.0		
PICK LP ON BOTH SIDES	VALIANT ST	TO 4TH ST	5	9:53	.1	18	36
DRIVE ON	4TH ST	TO 4TH ST	15	9:53	.0		
PICK LP ON BOTH SIDES	4TH ST	TO 4TH ST	5	10:00	.0	10	41
DRIVE ON	4TH ST	TO 4TH ST	5	10:00 TO 10:15	.0		
PICK LP ON BOTH SIDES	4TH ST	TO 4TH ST	5	10:21	.0	8	43
DRIVE ON	4TH ST	TO 4TH ST	15	10:21	.0		
PICK LP ON BOTH SIDES	4TH ST	TO 4TH ST	15	10:21	.0		
DRIVE ON	4TH ST	TO 4TH ST	5	10:30	.0	12	46
PICK LP ON BOTH SIDES	4TH ST	TO 4TH ST	5	10:37	.0	10	49
DRIVE ON	4TH ST	TO 4TH ST	15	10:37	.0		
PICK LP ON BOTH SIDES	4TH ST	TO 4TH ST	15	10:37	.0		
DRIVE ON	4TH ST	TO 4TH ST	15	10:45	.0		
PICK LP ON BOTH SIDES	4TH ST	TO 4TH ST	5	10:51	.0	10	52
DRIVE ON	4TH ST	TO 4TH ST	15	10:51	.0		
PICK LP ON BOTH SIDES	4TH ST	TO 4TH ST	15	10:51	.0		
DRIVE ON	4TH ST	TO 4TH ST	5	10:58	.0	10	54
PICK LP ON BOTH SIDES	4TH ST	TO 4TH ST	5	11:06	.0	8	57
DRIVE ON	4TH ST	TO 4TH ST	15	11:06	.0		
PICK LP ON BOTH SIDES	4TH ST	TO 4TH ST	15	11:07	.0	12	59
DRIVE ON	4TH ST	TO 4TH ST	15	11:26	.1	28	63
PICK LP ON BOTH SIDES	4TH ST	TO 4TH ST	5	11:27	.1	71	71
DRIVE ON	4TH ST	TO 4TH ST	15	11:41	.1	20	76
PICK LP ON BOTH SIDES	4TH ST	TO 4TH ST	5	11:46	.0	6	78
DRIVE ON	4TH ST	TO 4TH ST	5	11:50	.1	6	79

ACTION	SPEED (MPH)	TIME (HR:MIN)	DISTANCE (MILES)	HOUSEHOLDS SERVICED	LOAD (PCT)
PICK UP ON BOTH SIDES	5	12:03 TO 12:03	0.0	18	84
BREAK FOR LUNCH					
DRIVE ON 6TH ST	15	12:33 TO 12:33	0.0		84
DRIVE ON 6TH ST	15	12:33 TO 12:33	0.0		84
PICK UP ON BOTH SIDES	15	12:46 TO 12:46	0.2	16	89
DRIVE ON 4TH ST	15	12:47 TO 12:47	0.1		89
PICK UP ON BOTH SIDES	15	12:51 TO 12:51	0.0	6	91
DRIVE ON 4TH ST	15	12:51 TO 12:51	0.0		91
PICK UP ON BOTH SIDES	15	12:53 TO 12:53	0.0	2	91
PICK UP ON BOTH SIDES	5	12:56 TO 12:56	0.0	4	92
PICK UP ON BOTH SIDES	5	13:01 TO 13:01	0.1	6	94
PICK UP ON BOTH SIDES	5	13:07 TO 13:07	0.2	6	96
DRIVE ON WHERRY RD	15	13:07 TO 13:07	0.3		96
DRIVE ON PERIMETER RD	25	13:08 TO 13:08	0.3		96
DRIVE ON 11TH ST	25	13:10 TO 13:10	1.0		96
DRIVE ON SOUTHWAY 193	25	13:11 TO 13:11	0.1		96
DRIVE ON SOUTHWAY 193	25	13:11 TO 13:11	0.2		96
DRIVE ON ROAD TO/FRM DAVIS LANO FILL	50	13:12 TO 13:12	1.3		96
DRIVE ON ROAD TO/FRM DAVIS LANO FILL	40	13:15 TO 13:15	1.6		96
UNLOAD		13:15 TO 13:15			
DRIVE ON ROAD TO/FRM DAVIS LANO FILL	40	13:27 TO 13:27	1.6		
DRIVE ON HIGHWAY 193	50	13:28 TO 13:28	1.3		
DRIVE ON SOUTHWAY 193	25	13:31 TO 13:31	1.0		
DRIVE ON 2ND ST	25	13:31 TO 13:31	0.2		
DRIVE ON 2ND ST	25	13:31 TO 13:31	0.1		

ROUTE 2	HILL AFB, UTAH	16 CU YO VEHICLE	SPEED (MPH)	TIME (HR:MIN)	DISTANCE (MILES)	HOUSEHOLDS SERVICED	LCAO (PCT)
ACTION							
LEAVE GARAGE							
DRIVE ON	E ST	TO E ST	25	8:00	.1		
DRIVE ON	8TH ST	TO 8TH ST	25	8:01	.4		
DRIVE ON		TO MINUTEMAN AVE	25	8:03	.9		
PICK UP ON	80TH STS	TO COLONY LOOP	5	8:07	.0	5	1
DRIVE ON	COLONY LOOP	TO	15	8:07	.0		1
PICK UP ON	80TH STS	TO	5	8:10	.0	3	2
PICK UP ON	80TH STS	TO	5	8:11	.0	2	3
PICK UP ON	80TH STS	TO	5	8:13	.0	2	4
PICK UP ON	80TH STS	TO	5	8:13	.0		4
DRIVE ON	COLONY LOOP	TO MINUTEMAN AVE	15	8:13	.0		4
PICK UP ON	80TH STS	TO MINUTEMAN AVE	5	8:15	.0	2	5
PICK UP ON	80TH STS	TO LEXINGTON	5	8:16	.0	2	5
PICK UP ON	80TH STS	TO CONCORD ST	5	8:27	.1	14	11
PICK UP ON	80TH STS	TO	5	8:27	.1		11
PICK UP ON	80TH STS	TO	5	8:34	.1	10	14
PICK UP ON	80TH STS	TO	5	8:42	.1	10	18
PICK UP ON	80TH STS	TO	5	8:48	.1	8	21
PICK UP ON	80TH STS	TO	5	8:50	.0	2	22
PICK UP ON	80TH STS	TO	5	8:53	.0	4	23
PICK UP ON	80TH STS	TO	5	9:02	.1	12	28
PICK UP ON	80TH STS	TO	5	9:09	.1	10	31
PICK UP ON	80TH STS	TO	5	9:17	.1	10	35
PICK UP ON	80TH STS	TO	5	9:17	.0		35
DRIVE ON	MINUTEMAN AVE	TO CONCORD ST	15	9:17	.0		35
PICK UP ON	80TH STS	TO	5	9:29	.1	16	41
PICK UP ON	80TH STS	TO	5	9:35	.1	8	44
PICK UP ON	80TH STS	TO	5	9:35	.1		44
DRIVE ON	CONGRESS	TO CONSTITUTION	15	9:35	.1		44
PICK UP ON	80TH STS	TO	5	9:37	.0	2	45
PICK UP ON	80TH STS	TO	5	9:40	.0	4	46
PICK UP ON	80TH STS	TO	5	9:52	.1	16	52
PICK UP ON	80TH STS	TO	5	9:52	.1		52
PICK UP ON	80TH STS	TO	5	9:54	.0	2	53
PICK UP ON	80TH STS	TO	5	9:56	.1	2	54
PICK UP ON	80TH STS	TO	5	9:56	.1		54
PICK UP ON	80TH STS	TO	5	10:03	.1	10	57
PICK UP ON	80TH STS	TO	5	10:03 TO 10:10			57
BREAK TIME							
PICK UP ON	80TH STS	TO	5	10:23	.0	6	59
PICK UP ON	80TH STS	TO	5	10:23	.0	6	62
PICK UP ON	80TH STS	TO	5	10:27	.0		62
PICK UP ON	80TH STS	TO	5	10:30	.0	4	63
PICK UP ON	80TH STS	TO	5	10:30	.0	4	65
PICK UP ON	80TH STS	TO	5	10:33	.0	4	65
PICK UP ON	80TH STS	TO	5	10:35	.0	2	65
DRIVE ON	REVERF CIRCLE	TO LIBERTY RD	15	10:35	.0		65
PICK UP ON	80TH STS	TO	5	10:35	.0		65
DRIVE ON	LIBERTY RD	TO FRANKLIN ST	15	10:35	.0		65
PICK UP ON	80TH STS	TO	5	10:38	.0	4	67
PICK UP ON	80TH STS	TO	5	10:43	.1	6	69
PICK UP ON	80TH STS	TO	5	10:43	.1		69
PICK UP ON	80TH STS	TO	5	10:52	.1	12	74
PICK UP ON	80TH STS	TO	5	10:52	.1	14	79
PICK UP ON	80TH STS	TO	5	11:02	.1		79
PICK UP ON	80TH STS	TO	5	11:05	.0	4	80
PICK UP ON	80TH STS	TO	5	11:05	.0		80
PICK UP ON	80TH STS	TO	5	11:09	.0	4	82
PICK UP ON	80TH STS	TO	5	11:09	.0		82
PICK UP ON	80TH STS	TO	5	11:12	.1	4	83
PICK UP ON	80TH STS	TO	5	11:12	.1		83
PICK UP ON	80TH STS	TO	5	11:22	.1	14	88
PICK UP ON	80TH STS	TO	5	11:22	.1		88
PICK UP ON	80TH STS	TO	5	11:31	.1	12	93
PICK UP ON	80TH STS	TO	5	11:31	.1		93

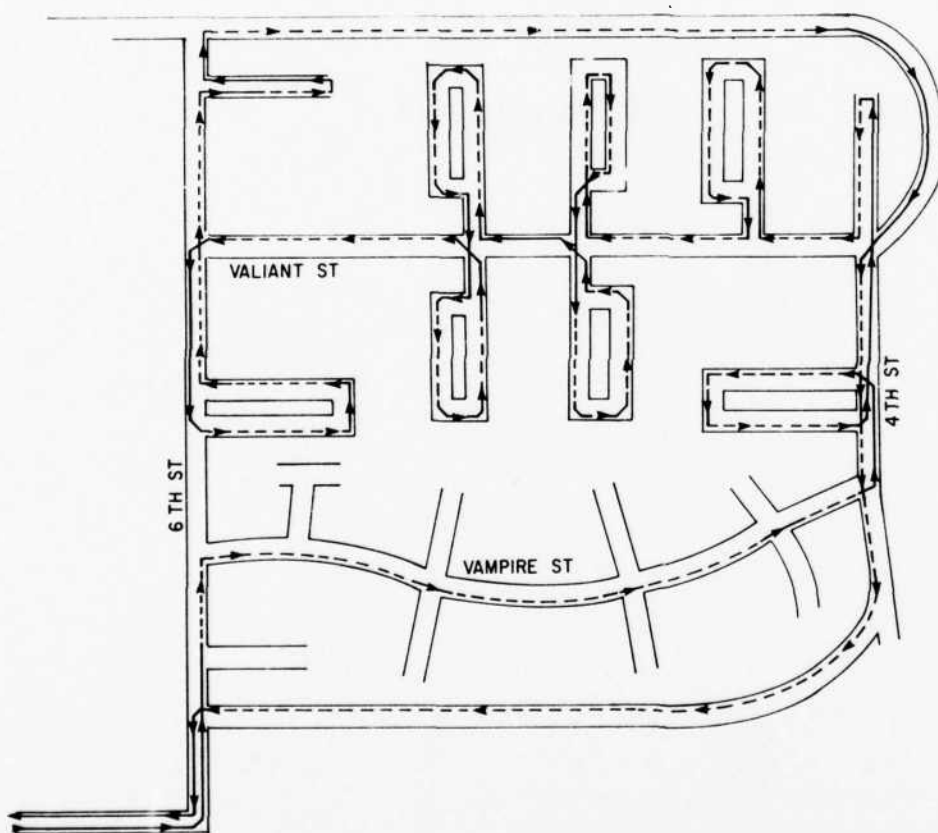
ACTION	SPEED (MPH)	TIME (HR:MIN)	DISTANCE (MILES)	HOUSEHOLDS SERVICED	LOAD (PCT)
PICK UP ON EOTH SIDFS FRANKLIN ST					
DRIVE ON	5	11:42	.1	14	98
PICK UP ON EOTH SIDFS CONGRESS	15	11:42	.1		98
DRIVE ON	5	11:47	.1	6	100
PICK UP ON EOTH SIDFS CONGRESS	5	11:53	.1	8	103
DRIVE ON	15	11:53	.1		103
DRIVE ON	15	11:54	.1		103
DRIVE ON	15	11:54	.1		103
PICK UP ON EOTH SIDFS CONSTITUTION	5	12:01	.1	10	107
BREAK FOR LUNCH		12:01 TO 12:31			
PICK UP ON EOTH SIDFS MALE	5	12:35	.1	4	108
DRIVE ON	15	12:35	.1		108
PICK UP ON EOTH SIDFS MINUTEMAN AVE	5	12:39	.1	4	110
DRIVE ON	25	12:40	.6		110
DRIVE ON	25	12:41	.4		110
DRIVE ON	25	12:42	.2		110
DRIVE ON	50	12:43	1.3		110
DRIVE ON	40	12:46	1.6		110
UNLOAD		12:46 TO 12:56			
DRIVE ON	40	12:58	1.6		
DRIVE ON	50	13:00	1.3		
DRIVE ON	25	13:02	1.0		
DRIVE ON	25	13:02	.2		
DRIVE ON	25	13:03	.1		

ROUTE 3			MILL #FB, UTAH			16 CU YD VEHICLE					
ACTION			SPEED (MPH)	TIME (HR:MIN)	DISTANCE (MILES)	HOUSEHOLDS SERVICED	LOAD (PCT)				
LFAVE GARAGE											
DRIVE ON		F ST	25	8:00	TO E ST			.1			
DRIVE ON		ATH ST	25	8:01	TO 8TH ST			.4			
DRIVE ON			25	8:04	TO LIBERTY RD			1.1			
PICK UP ON BOTH SIDES		LIBERTY RD	5	8:06	TO HAMILTON			.0	2		
PICK UP ON BOTH SIDES		HAMILTON	5	8:12	TO			.1	8		
PICK UP ON BOTH SIDES		HAMILTON	5	8:15	TO			.0	4		
PICK UP ON BOTH SIDES		HAMILTON	5	8:25	TO PRINCETON			.1	14		
PICK UP ON BOTH SIDES		PRINCETON	5	8:27	TO LEXINGTON			.1	11		
DRIVE ON		PRINCETON	15	8:28	TO HAMILTON			.1	11		
PICK UP ON BOTH SIDES		PRINCETON	5	8:30	TO LIBERTY RD			.1	2		
PICK UP ON BOTH SIDES		LIBERTY RD	5	8:37	TO HAMILTON			.1	10		
DRIVE ON		LIBERTY RD	15	8:38	TO PRINCETON			.1	15		
PICK UP ON BOTH SIDES		LIBERTY RD	5	8:45	TO FREEDOM CIRCLE			.1	10		
PICK UP ON BOTH SIDES		FREEDOM CIRCLE	5	8:49	TO			.1	19		
PICK UP ON BOTH SIDES		FREEDOM CIRCLE	5	8:52	TO			.0	4		
DRIVE ON		FREEDOM CIRCLE	15	8:52	TO LIBERTY RD			.1			
DRIVE ON		LIBERTY RD	15	8:52	TO YORKTOWN			.1			
PICK UP ON BOTH SIDES		YORKTOWN	5	8:57	TO SARATOGA ST			.1	6		
PICK UP ON BOTH SIDES		YORKTOWN	5	9:03	TO			.0	8		
PICK UP ON BOTH SIDES		YORKTOWN	5	9:07	TO			.1	6		
PICK UP ON BOTH SIDES		YORKTOWN	5	9:11	TO SARATOGA ST			.1	4		
PICK UP ON BOTH SIDES		SARATOGA ST	5	9:16	TO			.1	6		
PICK UP ON BOTH SIDES		SARATOGA ST	5	9:17	TO			.0	2		
PICK UP ON BOTH SIDES		SARATOGA ST	5	9:25	TO YORKTOWN			.1	10		
DRIVE ON		YORKTOWN	15	9:25	TO LIBERTY RD			.1			
PICK UP ON BOTH SIDES		LIBERTY RD	5	9:44	TO			.2	26		
PICK UP ON BOTH SIDES		LIBERTY RD	5	9:55	TO YORKTOWN			.1	14		
PICK UP ON BOTH SIDES		LIBERTY RD	5	10:08	TO SARATOGA ST			.1	16		
ARFAK TIME											
PICK UP ON BOTH SIDES		SARATOGA ST	5	10:08 TO 10:23				.1	16		
PICK UP ON BOTH SIDES		SARATOGA ST	5	10:34	TO YORKTOWN			.1	4		
PICK UP ON BOTH SIDES		YORKTOWN	5	10:38	TO LIBERTY RD			.1	8		
DRIVE ON		LIBERTY RD	15	10:44	TO SARATOGA ST			.1			
PICK UP ON BOTH SIDES		LIBERTY RD	5	10:51	TO			.1	8		
DRIVE ON		MINUTEMAN AVE	15	10:52	TO MINUTEMAN AVE			.3			
DRIVE ON		MINUTEMAN AVE	15	10:53	TO 12TH ST			.1			
DRIVE ON		12TH ST	25	10:54	TO E ST			.6			
DRIVE ON		11TH ST	25	10:55	TO SOUTHGATE OR			.4			
DRIVE ON		SOUTHGATE OR	25	10:56	TO HIGHWAY 193			.2			
DRIVE ON		HIGHWAY 193	50	10:57	TO ROAD TO/FROM OAVIS LAND FILL			1.3			
DRIVE ON		ROAD TO/FROM OAVIS LAND FILL	40	10:59	TO LAND FILL			1.6			
UNLOAD											
DRIVE ON		ROAD TO/FROM OAVIS LAND FILL	40	10:59 TO 11:09							
DRIVE ON		DAVIS LAND FILL	40	11:12	TO HIGHWAY 193			1.6			
DRIVE ON		HIGHWAY 193	50	11:13	TO SOUTHGATE OR			1.3			
DRIVE ON		SOUTHGATE OR	25	11:16	TO 2ND ST			1.0			
DRIVE ON		2ND ST	25	11:16	TO			.2			
DRIVE ON			25	11:16	TO GARAGE			.1			

ROUTE	4	HILL AFB. UTAH	16 CU YD VEHICLE	SPEED (MPH)	TIME (HR:MIN)	DISTANCE (MILES)	HOUSEHOLDS SERVICED	LCAO (PCT)
LEAVE GARAGE					8:00			
DRIVE ON		2ND ST	25	8:00	.1			
DRIVE ON		D ST	25	8:00	.0			
DRIVE ON		D ST	25	8:01	.2			
PICK UP ON		D ST	5	8:02	.0		1	
PICK UP ON		D ST	5	8:03	.0		1	
PICK UP ON		BOTH SIDES SERVICE ROAD	5	8:08	.1		5	2
PICK UP ON		E ST	5	8:09	.0		1	2
PICK UP ON		E ST	5	8:10	.0		1	3
PICK UP ON		E ST	5	8:16	.1		8	6
DRIVE ON		D ST	25	8:17	.2			6
DRIVE ON		2ND ST	25	8:23	2.7			6
DRIVE ON		GEORGIA ST	25	8:24	.2			6
DRIVE ON		SERVICE ROAD	25	8:24	.0			6
PICK UP ON		SERVICE ROAD	15	8:24	.0		3	7
DRIVE ON		SERVICE ROAD	5	8:28	.1			7
DRIVE ON		GEORGIA ST	15	8:28	.0			7
DRIVE ON		TO	15	8:28	.0			7
DRIVE ON		TO ASPEN AVE	15	8:30	.1		2	8
DRIVE ON		TO	15	8:30	.0			8
DRIVE ON		TO ARSENAL RD	15	8:30	.0			8
PICK UP ON		EDTH SIDES	5	8:33	.0		4	9
DRIVE ON		EDTH SIDES	15	8:34	.0			9
DRIVE ON		EDTH SIDES	15	8:34	.0			9
DRIVE ON		EDTH SIDES	25	8:38	1.8			9
DRIVE ON		EDTH SIDES	25	8:39	.5			9
DRIVE ON		EDTH SIDES	40	8:40	.2			9
DRIVE ON		EDTH SIDES	40	8:42	1.3			9
DRIVE ON		EDTH SIDES	50	8:43	1.4			9
DRIVE ON		EDTH SIDES	40	8:46	1.6			9
UNLOAD				8:46	TD	8:56		
DRIVE ON		ROAD TO/FROM DAVIS LANO FILL	40	8:58	1.6			
DRIVE ON		ROAD TO/FROM DAVIS LANO FILL	50	9:00	1.3			
DRIVE ON		ROAD TO/FROM DAVIS LANO FILL	25	9:02	1.0			
DRIVE ON		ROAD TO/FROM DAVIS LANO FILL	25	9:02	.2			
DRIVE ON		ROAD TO/FROM DAVIS LANO FILL	25	9:03	.1			

APPENDIX B

ORIGINAL ROUTE MAPS



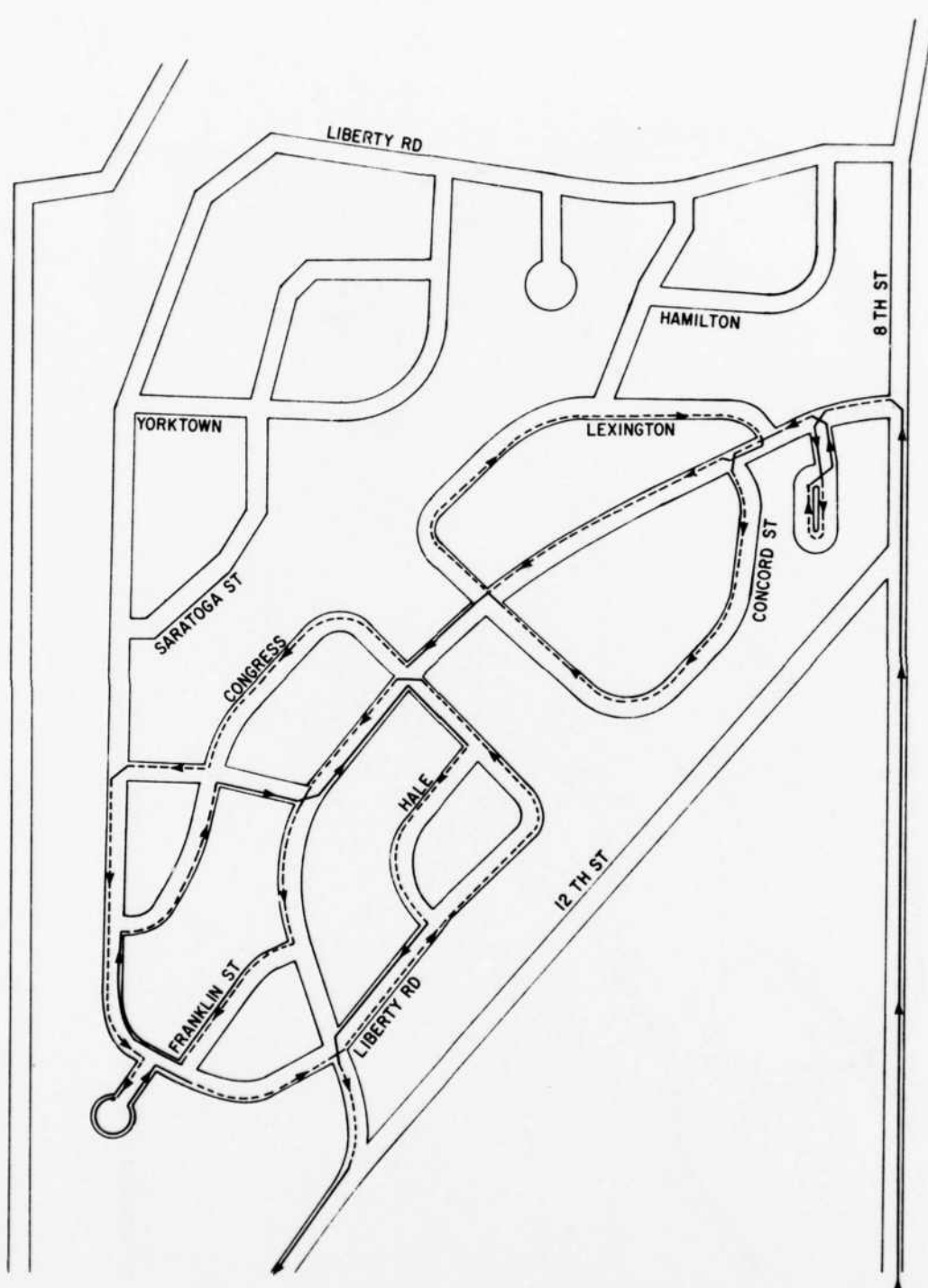
HILL AFB, UTAH

ROUTE 1
16 CU YD VEHICLE

TRAVEL

COLLECT BOTH SIDES

COLLECT RIGHT SIDE



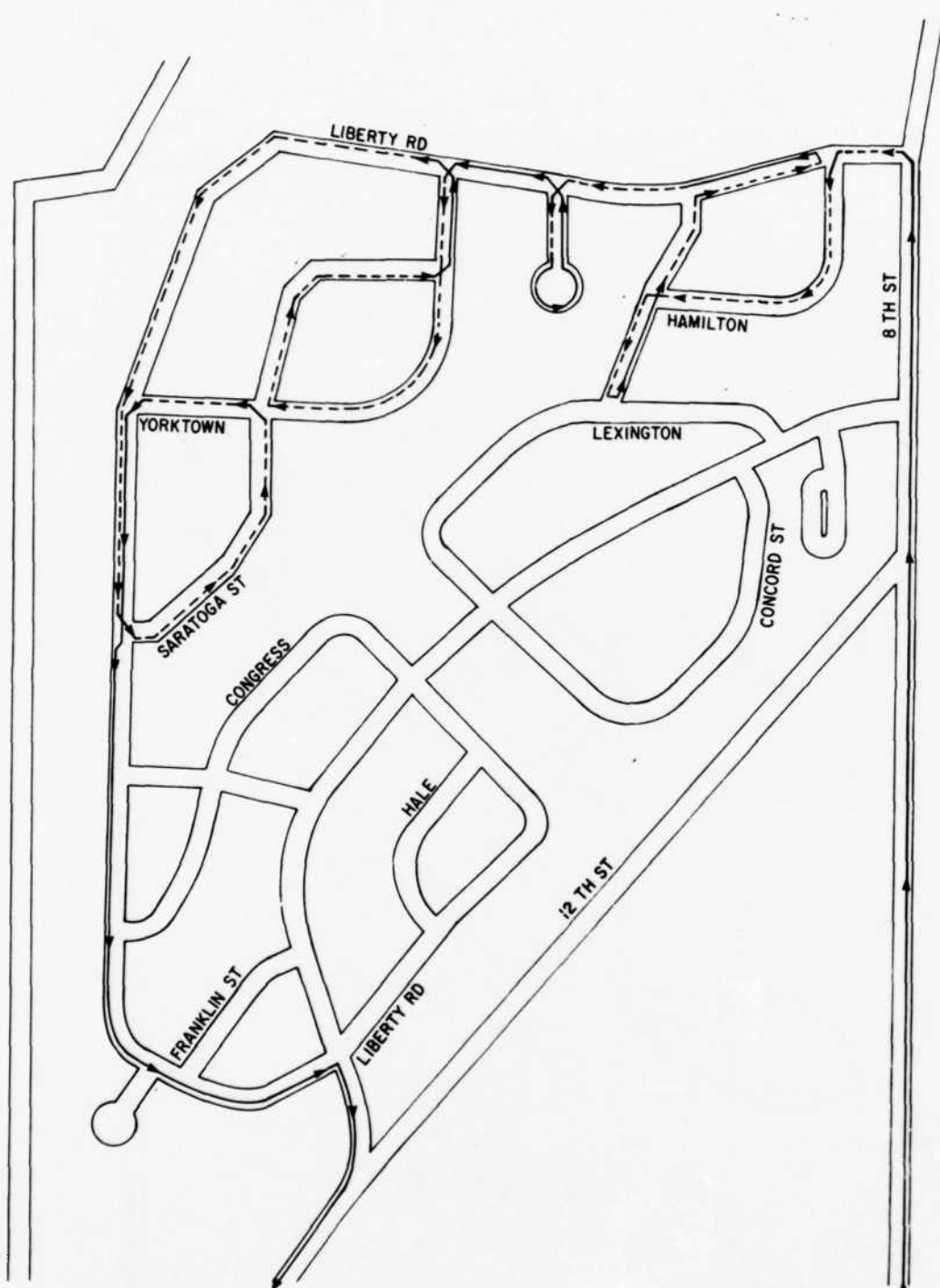
HILL AFB, UTAH

ROUTE 2
16 CU YD VEHICLE

TRAVEL

COLLECT BOTH SIDES

COLLECT RIGHT SIDE



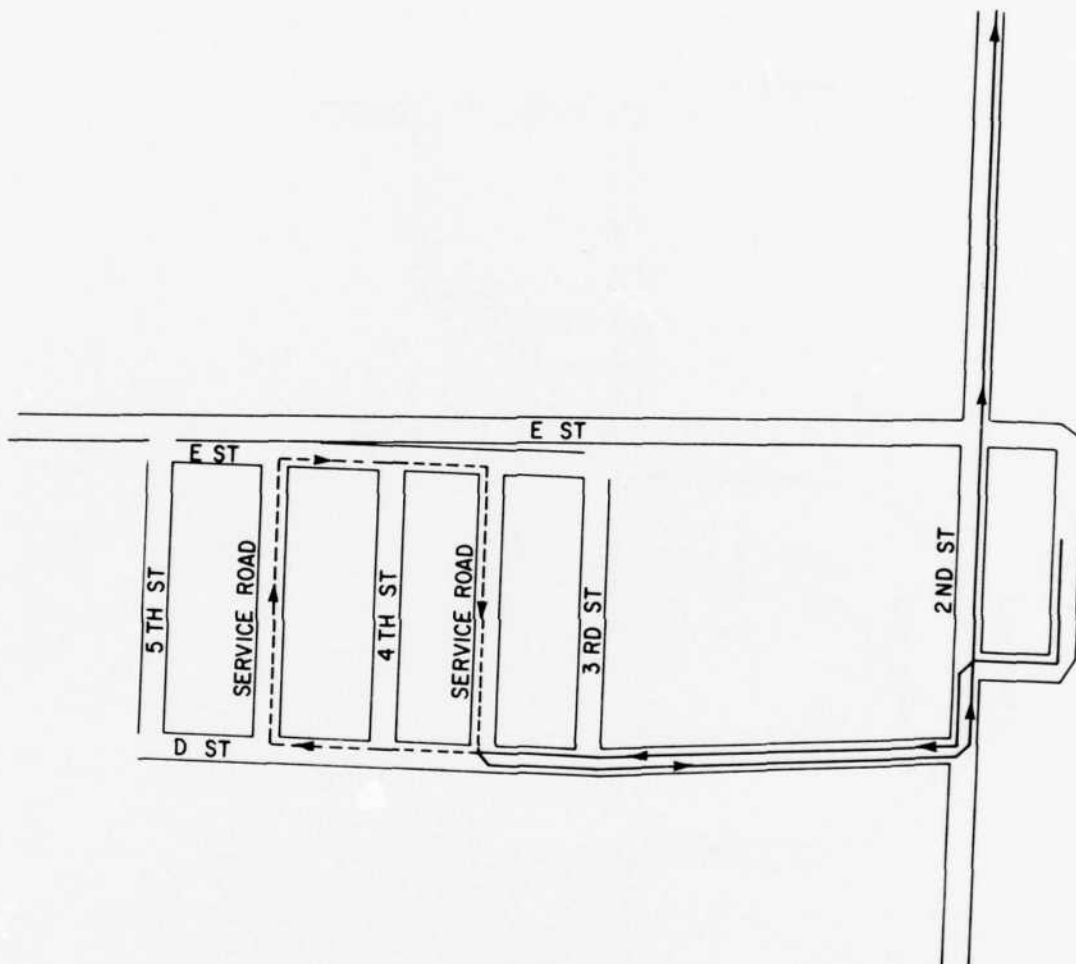
HILL AFB, UTAH

ROUTE 3
16 CU YD VEHICLE

TRAVEL

COLLECT BOTH SIDES

COLLECT RIGHT SIDE

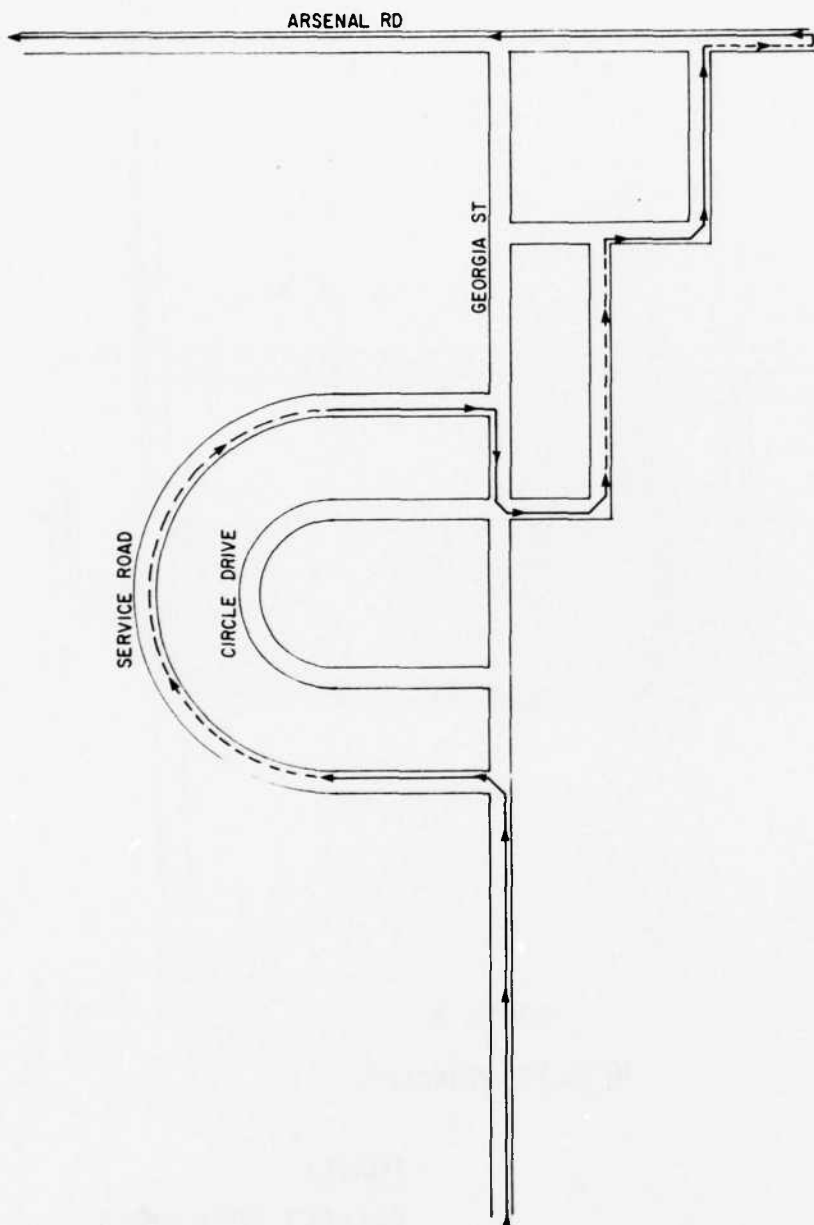


HILL AFB, UTAH

ROUTE 4

16 CU YD VEHICLE

TRAVEL
 COLLECT BOTH SIDES
 COLLECT RIGHT SIDE



HILL AFB, UTAH

ROUTE 4
16 CU YD VEHICLE

TRAVEL
COLLECT BOTH SIDES
COLLECT RIGHT SIDE

APPENDIX C

RCINPT DATA

HILL AFH. UTAH

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6TH ST
VAMPIRE ST

4TH ST

VALIANT ST

LIBERTY RD
HAMILTON
PRINCETON
FREEDOM CIRCLE
YORKTOWN
SARATOGA ST
COLONY LOOP
LEXINGTON
CONCORD ST
MINUTEMAN AVE
CONGRESS
FRANKLIN ST
REVERE CIRCLE
CONSTITUTION

45	HALE							
46	SERVICE ROAD							
60	GEORGIA ST							
61								
62								
63								
64	ASPEN AVE							
65								
66	ARSENAL RD							
67	CIRCLE DRIVE							
70	6TH ST							
71	HIGHWAY 193							
72	ROAD TO/FRCM DAVIS LAND FILL							
73	WHERRY RD							
74	11TH ST							
75	SOUTHGATE DR							
76	2ND ST							
78	12TH ST							
79	8TH ST							
80	PERIMETER RD							
81	E ST							
82								
83								
85	3RD ST							
86	SERVICE ROAD							
87	4TH ST							
88	SERVICE ROAD							
89	5TH ST							
90	D ST							
91	E ST							
7/8/9	(END OF RECORD)							
0.	6.1	2.	12.	30.	10.			
0.	8.	0.	10.	10.	10.			
0.	6.	0.	8.	20.	10.			
7/8/9	(END OF RECORD)							
.1	800.							
25.								
72 1050	103 0.0 1040/40 (.55.1.5) (1.3.1.5)							
71 1050	83 0.0 1070/50 (.) (.9.4.85)							

71 1070 9 0.0 1080 / 50 (,) LC (.58.5.21)
71 1080 88 0.0 1090 / 40 (,) (0.58.8.75)
50 1090 3 0.0 1095 / 40 (,) (0.71.8.77)
50 1095 7 0.0 1100 / 40 (,) (0.85.9.02)
50 1100 18 0.0 1110 / (,) (1.4.9.46)
50 1110 16 0.0 1120 / (,) (2.05.9.46)
70 1120 12 0.0 1130 / (,) (2.08.9.92)
70 1130 69 0.0 1140 / (,) (4.30.11.5)
70 1140 23 0.0 1150 / (,) LC (5.18.11.75)
70 1150 18 0.0 825 / (,) (5.9.11.77)
61 1170 12 0.0 1180 / (5.9.11.3) (5.9.10.8)
76 1180 35 0.0 1190 / (,) (4.5.10.8)
76 1190 24 0.0 1200 / (,) RC (3.68.10.4)
76 1200 25 0.0 1210 / (,) RC (3.2.9.5)
76 1210 35 0.0 1220 / (,) RC (2.9.8.15)
76 1220 54 0.0 1230 / (,) (2.9.6.0)
76 1230 5 0.0 1250 / (,) (2.9.5.78)
76 1250 2 0.0 1260 / (,) (2.9.5.7)
90 1260 9 0.0 950 / (,) (2.54.5.7)
76 1260 9 0.0 1270 / (,) (2.9.5.32)
75 1270 13 0.0 1280 / (,) (2.35.5.32)
75 1280 9 0.0 1290 / (,) RC (2.14.5.08)
75 1290 11 0.0 1300 / (,) LC (1.85.4.85)
75 1300 20 0.0 1310 / (,) (1.05.4.85)
75 1310 13 0.0 1070 / (,) (,)
74 1310 7 0.0 1320 / (,) (1.55.4.58)
81 1320 5 0.0 1330 / (,) (0.85.4.58)
81 1330 13 0.0 1340 / (,) RC (0.6.4.18)
81 1340 28 0.0 1350 / (,) (0.6.3.05)
81 1350 17 0.0 1360 / (,) RC (1.0.2.59)
73 1360 22 0.0 1370 / (,) (1.88.2.59)
74 1310 28 0.0 1470 / (,) (1.05.5.94)
82 1230 19 0.0 1240 5 0.0 1390 22 0.0 1470
78 1470 11 0.0 1460 / (,) LC (0.76.6.2)
78 1460 14 0.0 1450 / (,) (0.76.6.72)
78 1450 14 0.0 1445 / (,) (1.08.7.19)
78 1445 33 0.0 1400 / (,) (1.95.8.19)
79 1390 54 0.0 1400 / (,) (,)
79 1400 6 0.0 1405 10 0.0 1410 / (,) (1.95.8.82)

79 1410 4 0.0 1411 13 0.0 1120 / (,) RR
 83 1250 5.5 0.0 5 4.5 0.0 1230/(,) RR
 7/8/9 (END OF RECORD)
 .1 100. 2.5
 0.75
 2 1370 19 0.0 10 / (0.75,0.12) (0.75,0.90)
 1 10 81 0.6 15 / (,) (4.00,0.90)
 23 20 43 6.0 15/(5.4,1.7) LC
 23 30 19 2.2 20 / (5.3,2.48)
 10 35 23 6.0 40 7 0.0 45 11 2.0 30 / (5.28,4.10)
 11 50 26 10.0 35 / (5.28,5.15)
 21 55 47 0.0 35/(5.25,5.6) LC
 21 65 113 0.16 55/ (0.75,5.60)
 2 10 10 0.0 70 17 4.0 75 22 4.0 80 6 0.0 85 24 6.0 90 27 6.0 95 10 0.0
 65 / (,) (0.75,5.59)
 19 100 25 0.18 95 / (1.72,5.20)
 13 35 19 0.4 105 29 8.10 110 18 0.0 115 47 14,14 90 / (,) (0.75,4.10)
 14 120 28 0.10 125 9 0.0 105 / (4.25,5.30) L7
 14 120 28 8.0 125 / (,) R21
 15 130 25 10.0 135 11 0.0 110 / (3.60,5.30) R6
 15 130 25 0.8 135 / (,) L19
 16 140 26 0.12 145 9 0.0 110 / (3.62,2.98) L7
 16 140 26 10.0 145 / (,) R19
 17 150 25 0.10 155 10 0.0 115 / (2.39,5.26) L6
 17 150 25 8.0 155 / (,) R19
 18 160 24 12.0 165 10 0.0 115 / (2.41,2.99) R6
 18 160 24 0.10 165 / (,) L18
 20 80 56 20.0 85/(,) RR
 4 175 18 0.0 70 / (1.52,1.30)
 3 75 17 2.4 265 24 12,12 190/(,) LC (2.35,1.8)
 3 190 34 8.12 185 26 8,12 205/(,) RC (4.65,2.2)
 3 205 18 2.2 30
 26 210 12 0.0 205 19 0.0 220/(4.35,2.6) LC (4.9,1.5)
 8 230 19 0.0 185 / (3.49,2.53)
 9 235 17 0.0 185 / (3.81,1.13)
 6 240 18 0.0 190 / (2.5,2.51)
 7 245 18 0.0 190 / (2.2,1.08)
 22 250 8 0.0 255 6 0.0 260 / (1.80,2.55) (1.24,2.55)
 5 255 13 0.0 265

12 40 59 20.0 45/(.) RR
 7/8/9 (END OF RECORD)
 .1 50. 2.5
 61 1170 26 0.0 805 43 2.1 810 26 0.0 815 42 0.0 820 48 0.0 825/ (4.8.2.55)
 (4.8.10.0)
 60 1170 42 0.0 830/(.) (3.1.2.55)
 60 850 42 0.0 815/(3.1.6.4)
 60 830 149 3.0 850/(.) LC
 67 805 44 0.0 870/(.) (3.05.3.65)
 67 880 44 0.0 810/(3.05.5.35)
 67 870 67 0.0 880/(.) LC
 62 810 25 0.0 890 / (.) (5.8.5.36)
 63 890 68 2.0 895 / (.) (5.8.8.08)
 64 820 25 0.0 895 / (.)
 64 895 25 0.0 900 / (.) (6.8.8.08)
 65 900 48 0.0 905 / (.) (6.8.10.0)
 66 825 51 0.0 905 30 4.0 902/ (.) (8.10)
 7/8/9 (END OF RECORD)
 .1 50. 2.5
 25.
 89 1240 8 0.0 975/(.75.5.8) (.75.5.48)
 90 950 40 0.0 955 / (7.31.1.0) (5.72.1.0)
 90 955 38 0.1 960 / (.) (4.21.1.0)
 90 960 44 0.1 965 / (.) (2.47.1.0)
 90 965 43 0.0 970 / (.) (0.75.1.0)
 89 970 112 0.0 975 / (.) (0.75.5.48)
 91 975 43 0.0 980 44 1.0 985 38 1.0 990 40 0.0 995/ (.) (7.31.5.48)
 85 995 112 0.0 950 / (.)
 86 990 112 2.6 955 / (.)
 87 985 112 0.0 960 / (.)
 88 980 112 0.5 965 / (.)
 7/8/9 (END OF RECORD)
 .1 200. 2.5
 31 1410 13 2.0 300 / (5.4.7.65) (4.93.7.65)
 31 300 22 6.4 315 / (.) (4.05.7.41)
 31 315 21 6.4 320 / (.) LC (3.22.7.45)
 31 320 17 0.0 325 41 14.12 335/ (.) R44 (1.04.7.35)

31 335 35 4.10 340 / (.) (.57,6.05)
31 340 35 10.6 345 22 6.2 350 24 6.4 355 / (,) (0.50,2.78)
31 355 11 6.0 356 / (.) (0.5,2.32)
31 356 12 2.4 360 / (.) RC (0.75,1.95)
31 360 5 0.0 365 / (.) (0.92,1.85)
31 365 12 4.0 370 / (.) R7 (1.38,1.72)
31 375 15 2.4 370 / (1.89,2.0)
43 360 9 2.2 358 / (.) (0.55,1.65)
43 358 5 0.2 359 / (.) LC (0.48,1.52)
43 359 5 0.4 358 / (.) LC
40 1405 12 4.1 390 / (.) (4.9,5.98)
40 390 8 2.0 395 / (.) (4.61,5.85)
40 395 7 2.0 400 / (.) (4.36,5.72)
40 400 25 8.8 402 / (.) (3.45,5.25)
40 402 19 4.4 405 / (.) (2.83,4.8)
40 405 16 0.0 410 / (.) RC (2.34,4.35)
40 410 24 6.8 415 / (.) RC (1.73,3.58)
40 415 24 6.6 420 / (.) RC (1.67,2.65)
40 420 17 0.2 375 / (.) RC
31 375 25 6.6 430 / (.) (2.5,2.8)
37 390 7 0.0 435 / (.) (4.95,5.67)
37 435 10 0.3 440 / (.) (4.97,5.28)
37 440 6 0.2 445 / (.) LC (4.81,5.28)
37 445 8 0.2 450 / (.) (4.81,5.59)
37 450 4 0.0 435 / (.)
39 405 21 4.4 455 / (.) (3.48,4.22)
39 455 15 8.2 460 / (.) RC (4.4,4.29)
39 460 14 6.4 462 / (.) (4.4,4.68)
39 462 27 8.6 400 / (.) R21
38 405 10 2.0 465 / (.) (2.58,5.09)
38 465 11 0.4 470 / (.) LC (2.55,5.45)
38 470 14 6.6 472 / (.) (2.95,5.85)
38 472 16 4.6 475 / (.) LC (3.54,6.04)
38 475 29 2.8 395 / (.) L23
33 475 19 0.2 485 / (.) L6 (3.81,6.75)
33 485 18 0.2 315 / (.) R13
32 485 21 8.6 495 / (.) RC (4.65,6.68)
32 495 11 2.2 500 / (.) RC (4.93,6.98)
32 500 18 4.4 300

35 340 21 6.2 505 18 0.4 510 / (.) (2.1.6.0)
35 510 16 4.2 515 / (.) RC (2.51.6.43)
35 515 12 6.2 520 16 4.2 325 / (.)
36 520 18 4.6 525 / (.) (1.8.6.9)
36 525 7 2.0 530 / (.) RC (1.58.6.74)
36 530 19 6.0 505
36 505 25 4.0 545/(.) L16 (1.22.5.07)
36 545 21 6.10 345/(.) L16
41 410 11 2.0 555 / (.) (2.07.4.63)
41 555 9 4.0 560 / (.) RC (1.76.4.62)
41 560 21 8.8 565 / (.) (1.18.4.0)
41 565 7 2.0 570 14 4.4 575 / (.) (0.99.3.18)
41 575 18 0.6 355/(.) L12
46 415 16 0.0 570 15 2.0 350 / (.) R16
42 420 28 6.8 365/(.) R7
40 375 23 2.2 1445 / (.) LC (.)
34 320 14 4.0 321 4 4.0 322 / (.) (3.22.6.73)
34 322 7 0.0 321 / (.) RC
44 410 15 0.4 411 10 0.4 412 / (.) (3.05.3.6)
44 412 9 0.4 413 / (.) LC (3.02.3.31)
44 413 19 6.8 430 / (.)
45 430 17 0.4 414 / (.) LC (2.35.3.4)
45 414 16 4.6 411 / (.)
7/8/9 (END OF RECORD)
7/8/9 (END OF RECORD)

APPENDIX D

PHASE4 DATA

10.	15.	14.
12.	2.57	3.47
12.	2.57	3.47
12.	5.5	6.4
12.	5.5	6.4
12.	7.	9.
12.	7.	9.
12.	7.	9.
12.	7.	9.
12.	11.03	12.03
12.	11.03	12.03

430	207C	413	206C	412	205C	411	204C	410	157T	405	156C	402	155C	400	170T
462	169T	460	168T	455	167T	405	157T	410	204T	411	209C	414	208C	430	161T
375	148C	370	147C	365	199C	420	159C	415	158C	410	191C	555	192C	560	193C
565	194C	570	195C	575	196C	355	144C	356	145C	360	149C	358	151C	359	150C
358	149T	360	145T	356	144T	355	143C	350	142C	345	141C	340	181T	505	189C
545	190C	345	142T	350	198C	570	197T	415	159T	420	160C	375			
8	4.117	2		270.000		265.000									
375	200T	1445	40T	1450	39T	1460	38T	1470	34T	1310	27T	1070	2T	1050	1T
1040															
5	1.341	3		270.000		258.000									
5	48T	1230	35T	1240	36T	1390	42T	1400	43T	1405					
74	7.656	3		270.000		258.000									
1405	152C	390	162T	435	166T	450	165C	445	164C	440	163C	435	162T	390	153C
395	154C	400	170C	462	169C	460	168C	455	167C	405	171C	465	172C	470	173C
472	174C	475	176C	485	177C	315	137C	320	201C	321	202C	322	203T	321	201T
320	138T	325	139C	335	140C	340	181C	505	188C	530	187C	525	186C	520	184C
515	183C	510	182C	505	188T	530	187T	525	186T	520	185C	325	138T	320	137T
315	136C	300	135C	1410	45T	1411	46T	1120	9T	1130	10T	1140	11T	1150	12T
825	119T	905	120C	902	120T	905	118T	900	117T	895	115C	890	114T	810	104C
805	103T	1170	108T	830	110C	850	109T	815	106T	820	107T	825	12T	1150	11T
1140	10T	1130	9T	1120	46T	1411	45T	1410	135T	300	180C	500	179C	495	178C
485	176T	475	175C	395											
11	4.697	3		270.000		258.000									
395	153T	390	152T	1405	43T	1400	41T	1445	40T	1450	39T	1460	38T	1470	34T
1310	27T	1070	2T	1050	1T	1040									
7/8/9															

(END OF RECORD)

APPENDIX E

RCSP SCHEDULE

FINAL ROUTE SUMMARY HILL AFB, UTAH

ROUTE	VEHICLE IDENTIFICATION	VEHICLE CAPACITY (HOUSEHOLDS)	SECTION(S) TRIP1 TRIP2	DISTANCE (MILES)	TIME (H:MIN)	HOUSEHOLDS SERVICED (HOUSEHOLDS)	REFUSE QUANTITY (HOUSEHOLDS)
1	16 CU YD VEHICLE	270.0	1	13.5	4:51	350	262.5
2	16 CU YD VEHICLE	270.0	2	13.2	3:59	265	265.0
3	16 CU YD VEHICLE	270.0	3	17.8	4:05	258	258.0
TOTALS				44.5	12:55	873	785.5

TIME HR:MIN)	OISTANCE (MILES)	HOUSEHOLOS SERVICED	LCAO (PCT)
00:00	0	0	0
01:00	10	10	10
02:00	20	20	20
03:00	30	30	30
04:00	40	40	40
05:00	50	50	50
06:00	60	60	60
07:00	70	70	70
08:00	80	80	80
09:00	90	90	90
10:00	100	100	100
11:00	110	110	110
12:00	120	120	120
13:00	130	130	130
14:00	140	140	140
15:00	150	150	150
16:00	160	160	160
17:00	170	170	170
18:00	180	180	180
19:00	190	190	190
20:00	200	200	200
21:00	210	210	210
22:00	220	220	220
23:00	230	230	230
24:00	240	240	240

TO 2ND ST
TO SOUTHGATE OR
TO 11TH ST
TO PERIMETER RD
TO WHERRY RD
TO 6TH ST

TO
TO
TO
TO
TO

TO
TO
TO
TO

TO
TO
TO
TO
TO
TO 6TH ST

TO VALIANT ST
TO

TO
TO
TO
TO
TO

10
10
10
10
10

TO
TO
TO

ACTION	SPEED (MPH)	TIME (HR:MIN)	DISTANCE (MILES)	HOUSEHOLDS SERVICED	LOAD (PCT)
PICK UP ON FOTH SIGNS VALIANT ST	5	11:47	.1	10	78
DRIVE ON	15	11:47	.0		78
PICK UP ON FOTH SIGNS	5	11:55	.1	10	81
PICK UP ON FOTH SIGNS	5	12:01	.1	0	83
BREAK FOR LUNCH		12:01 TO 12:31			
DRIVE ON	15	12:31	.0		83
PICK UP ON FOTH SIGNS VALIANT ST	5	12:34	.0	4	84
DRIVE ON	15	12:34	.0		84
PICK UP ON FOTH SIGNS	5	12:41	.0	10	87
DRIVE ON	15	12:41	.0		87
PICK UP ON FOTH SIGNS 4TH ST	5	12:56	.1	20	92
DRIVE ON	15	12:56	.0		92
PICK UP ON FOTH SIGNS	5	12:59	.0	4	93
PICK UP ON FOTH SIGNS	5	13:04	.1	6	95
PICK UP ON FOTH SIGNS	5	13:10	.2	6	97
DRIVE ON	15	13:10	.0		97
DRIVE ON	25	13:11	.3		97
DRIVE ON	25	13:13	1.0		97
DRIVE ON	25	13:14	.1		97
DRIVE ON	25	13:14	.2		97
DRIVE ON	50	13:16	1.3		97
DRIVE ON	40	13:18	1.6		97
UNLOAD		13:18 TO 13:28			
DRIVE ON	40	13:30	1.6		
DRIVE ON	50	13:32	1.3		
DRIVE ON	25	13:34	1.0		
DRIVE ON	25	13:34	.2		
DRIVE ON	25	13:35	.1		

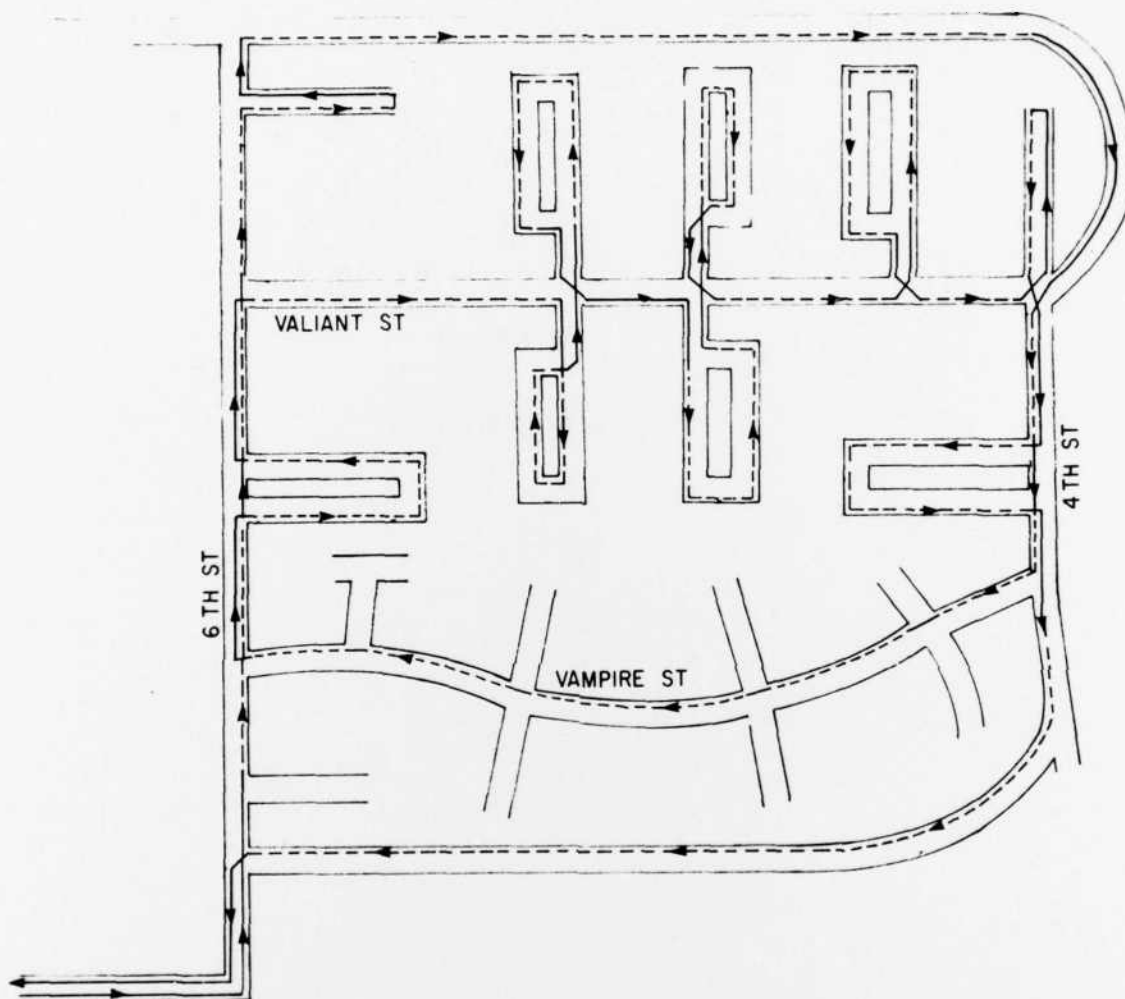
ROUTE 2	HILL AFB, UTAH	16 CU TO VEHICLE	SPEED (MPH)	TIME (H:M:S)	DISTANCE (MILES)	HOUSEHOLDS SERVED	LCAD (PCT)
LEAVE GARAGE				8:00			
DRIVE ON			25	8:00	-1		
DRIVE ON	2ND ST		25	8:00	-0		
DRIVE ON	U ST		25	8:01	-3		
PICK UP ON	BOTH SIDES SERVICE ROAD		5	8:05	-1	5	1
PICK UP ON	F ST		5	8:07	-0	1	2
PICK UP ON	F ST		5	8:08	-0	1	2
PICK UP ON	BOTH SIDES SERVICE ROAD		5	8:14	-1	8	5
PICK UP ON	U ST		5	8:15	-0	1	5
PICK UP ON	U ST		5	8:17	-0	1	6
DRIVE ON	U ST		25	8:17	-0		
DRIVE ON	5TH ST		25	8:17	-1		6
DRIVE ON	E ST		25	8:18	-4		6
DRIVE ON	12TH ST		25	8:19	-6		6
PICK UP ON	BOTH SIDES MINUTEMAN AVE		5	8:23	-1	4	7
PICK UP ON	BOTH SIDES LIBERTY RD		5	8:32	-1	12	12
PICK UP ON	BOTH SIDES CONSTITUTION		5	8:42	-1	14	17
PICK UP ON	BOTH SIDES CONSTITUTION		5	8:46	-0	4	18
PICK UP ON	BOTH SIDES CONSTITUTION		5	8:49	-0	4	20
PICK UP ON	BOTH SIDES CONSTITUTION		5	8:52	-1	4	21
DRIVE ON	MINUTEMAN AVE		15	8:52	-1		21
PICK UP ON	BOTH SIDES MINUTEMAN AVE		5	8:58	-1	8	24
PICK UP ON	BOTH SIDES MINUTEMAN AVE		5	9:10	-1	16	30
DRIVE ON	CONCORD ST		15	9:11	-3		30
DRIVE ON	MINUTEMAN AVE		15	9:12	-1		30
DRIVE ON	CONSTITUTION		15	9:12	-1		30
PICK UP ON	BOTH SIDES MALE		5	9:19	-1	10	34
PICK UP ON	BOTH SIDES MALE		5	9:23	-1	4	35
DRIVE ON	LIBERTY RD		15	9:23	-1		35
PICK UP ON	BOTH SIDES LIBERTY RD		5	9:28	-1	6	38
PICK UP ON	BOTH SIDES LIBERTY RD		5	9:31	-0	4	39
PICK UP ON	BOTH SIDES FRANKLIN ST		5	9:42	-1	14	44
PICK UP ON	BOTH SIDES MINUTEMAN AVE		5	9:51	-1	12	49
PICK UP ON	BOTH SIDES MINUTEMAN AVE		5	10:01	-1	14	54
BREAK TIME				10:01 TO 10:16			
PICK UP ON	BOTH SIDES CONGRESS		5	10:14	-0	2	55
PICK UP ON	BOTH SIDES CONGRESS		5	10:21	-0	4	56
PICK UP ON	BOTH SIDES CONGRESS		5	10:33	-1	10	62
PICK UP ON	BOTH SIDES CONGRESS		5	10:34	-0	2	63
PICK UP ON	BOTH SIDES CONGRESS		5	10:40	-1	8	66
PICK UP ON	BOTH SIDES CONGRESS		5	10:45	-1	6	69
PICK UP ON	BOTH SIDES CONGRESS		5	10:50	-0	6	70
PICK UP ON	BOTH SIDES LIBERTY RD		5	10:54	-0	6	72
PICK UP ON	BOTH SIDES REVERE CIRCLE		5	10:57	-0	4	74
PICK UP ON	BOTH SIDES REVERE CIRCLE		5	11:00	-0	4	75
PICK UP ON	BOTH SIDES REVERE CIRCLE		5	11:02	-0	2	76
DRIVE ON	REVERE CIRCLE		15	11:02	-0		76
DRIVE ON	LIBERTY RD		15	11:02	-1		76

ACTION	SPEED (MPH)	TIME (HR:MIN)	DISTANCE (MILES)	HOUSEHOLDS SERVICED	LOAD (PCT)
PICK LP ON 40TH SIGNS LIBERTY RD	5	11:10	.1	10	80
PICK LP ON 40TH SIGNS LIBERTY RD	5	11:16	.1	8	83
PICK LP ON 40TH SIGNS LIBERTY RD	5	11:29	.1	10	89
ORIVE ON YORKTOWN	15	11:29	.1		89
PICK LP ON 40TH SIGNS SARATOGA ST	5	11:33	.1	4	90
PICK LP ON 40TH SIGNS SARATOGA ST	5	11:44	.1	10	96
ORIVE ON LIBERTY RD	15	11:45	.1		96
PICK LP ON 40TH SIGNS	5	11:47	.1	2	97
ORIVE ON MINUTEMAN AVE	15	11:47	.1		97
PICK LP ON 40TH SIGNS MINUTEMAN AVE	15	11:49	.1	2	98
ORIVE ON MINUTEMAN AVE	15	11:50	.1		98
ORIVE ON 12TH ST	25	11:51	.6		98
ORIVE ON 11TH ST	25	11:52	.4		98
ORIVE ON SOUTHGATE OR	25	11:53	.2		98
ORIVE ON HIGHWAY 193	50	11:54	1.3		98
ORIVE ON ROAD TO/FROM DAVIS LANO FILL	40	11:56	1.6		98
UNLOAD		11:56 TO 12:06			
ORIVE ON ROAD TO/FROM DAVIS LANO FILL	40	12:09	1.6		
ORIVE ON HIGHWAY 193	50	12:10	1.3		
ORIVE ON SOUTHGATE OR	25	12:13	1.0		
ORIVE ON 2ND ST	25	12:13	.2		
ORIVE ON	25	12:13	.1		

ACTION	SPEED (MPH)	TIME (HR:MIN)	DISTANCE (MILES)	HOUSEHOLDS SERVICED	LOCAL (PCT)
DRIVE ON ASPEN AVE	15	11:11	.0		79
PICK UP ON BOTH SIDES	5	11:14	.1	2	79
DRIVE ON	15	11:14	.0		79
PICK UP ON BOTH SIDES	5	11:16	.0	3	81
DRIVE ON	15	11:16	.0		81
PICK UP ON BOTH SIDES	5	11:16	.0		81
DRIVE ON	15	11:20	.1	3	82
PICK UP ON BOTH SIDES	5	11:20	.0		82
DRIVE ON	15	11:21	.1		82
PICK UP ON BOTH SIDES	5	11:21	.1		82
DRIVE ON	25	11:25	1.8		82
PICK UP ON BOTH SIDES	25	11:26	.3		82
DRIVE ON	15	11:26	.0		82
PICK UP ON BOTH SIDES	5	11:32	.1	8	85
DRIVE ON	5	11:35	.0	4	86
PICK UP ON BOTH SIDES	5	11:35	.1	14	91
DRIVE ON	15	11:46	.1		91
PICK UP ON BOTH SIDES	5	11:54	.1	10	95
DRIVE ON	15	11:54	.1		95
PICK UP ON BOTH SIDES	25	11:57	1.1		95
DRIVE ON	25	11:58	.4		95
PICK UP ON BOTH SIDES	25	11:58	.2		95
DRIVE ON	50	12:00	1.3		95
PICK UP ON BOTH SIDES	40	12:02	1.6		95
BREAK FOR LUNCH		12:02 TO 12:32			
UNLOAD		12:32 TO 12:42			
DRIVE ON	40	12:45	1.6		
DRIVE ON	50	12:46	1.3		
DRIVE ON	25	12:48	1.0		
DRIVE ON	25	12:49	.2		
DRIVE ON	25	12:49	.1		

APPENDIX F

RCSP ROUTE MAPS



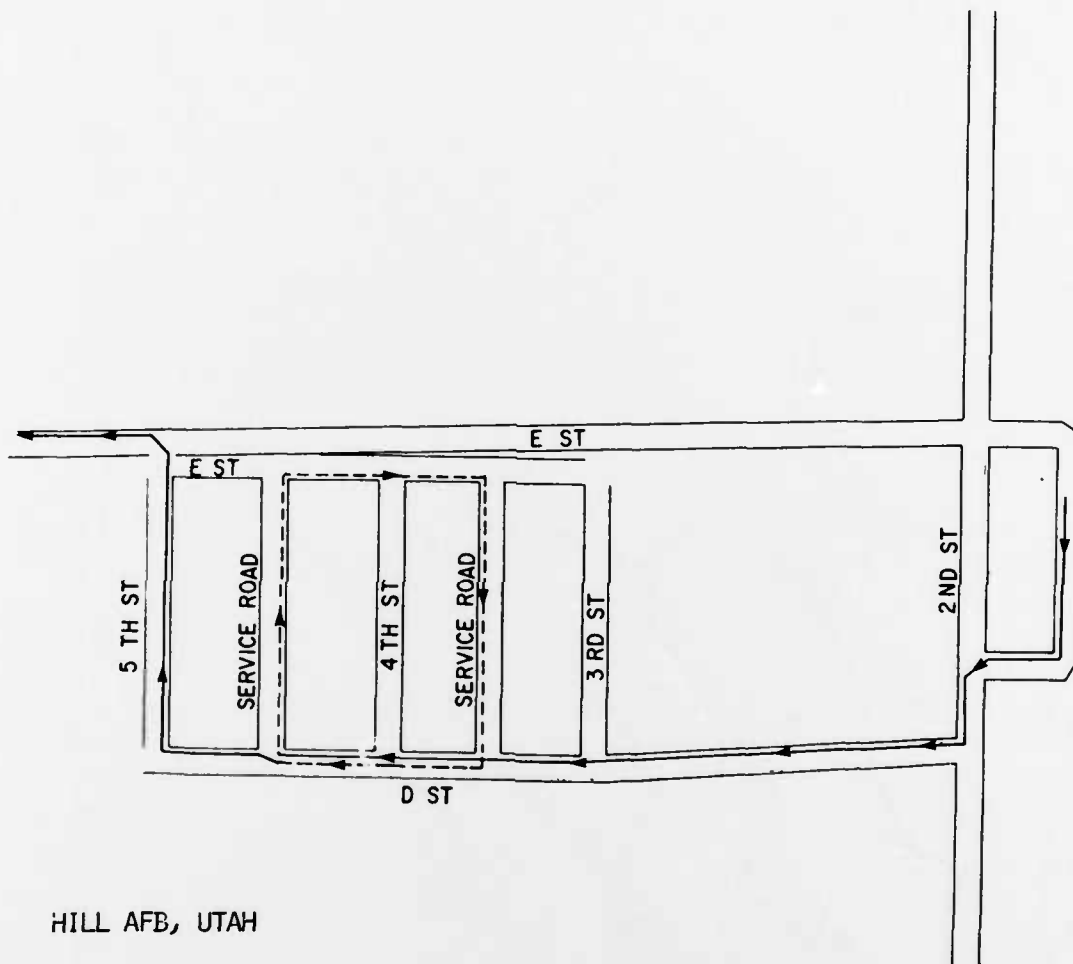
HILL AFB, UTAH

TRAVEL

COLLECT BOTH SIDES

COLLECT RIGHT SIDE

ROUTE 1
16 CU YD VEHICLE



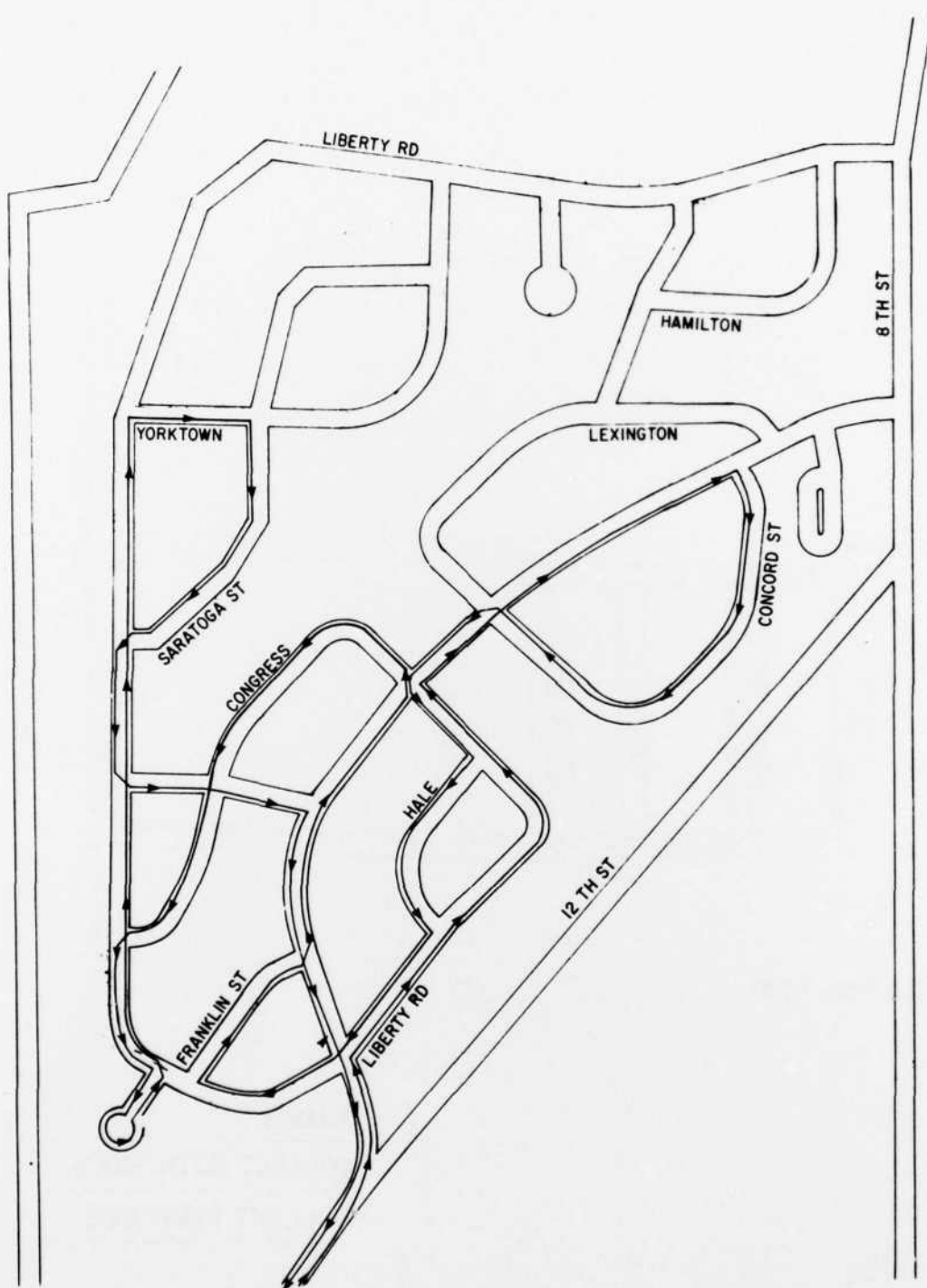
HILL AFB, UTAH

TRAVEL

COLLECT BOTH SIDES

COLLECT RIGHT SIDE

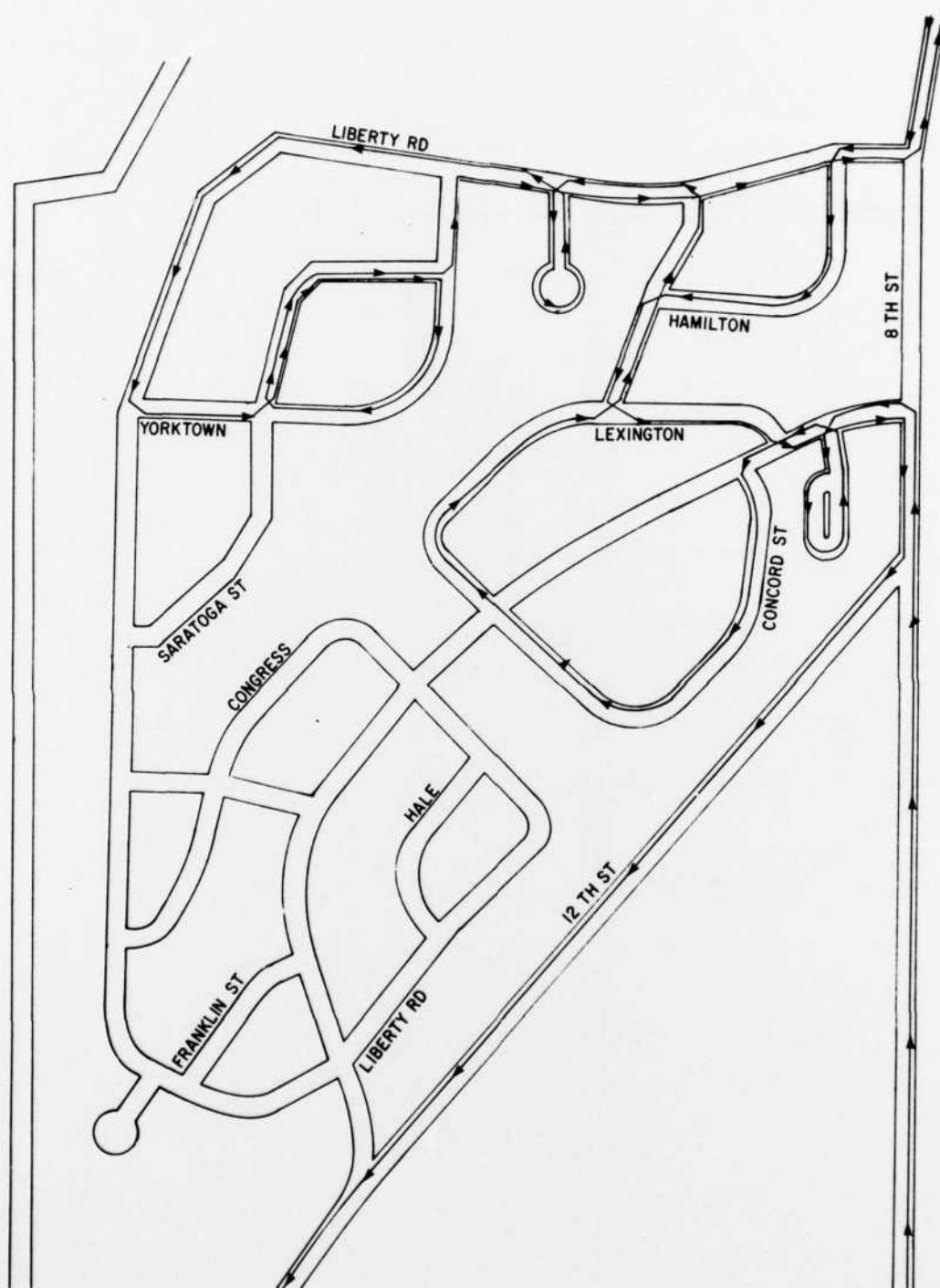
ROUTE 2
16 CU YD VEHICLE



HILL AFB, UTAH

ROUTE 2
16 CU YD VEHICLE

TRAVEL
COLLECT BOTH SIDES
COLLECT RIGHT SIDE



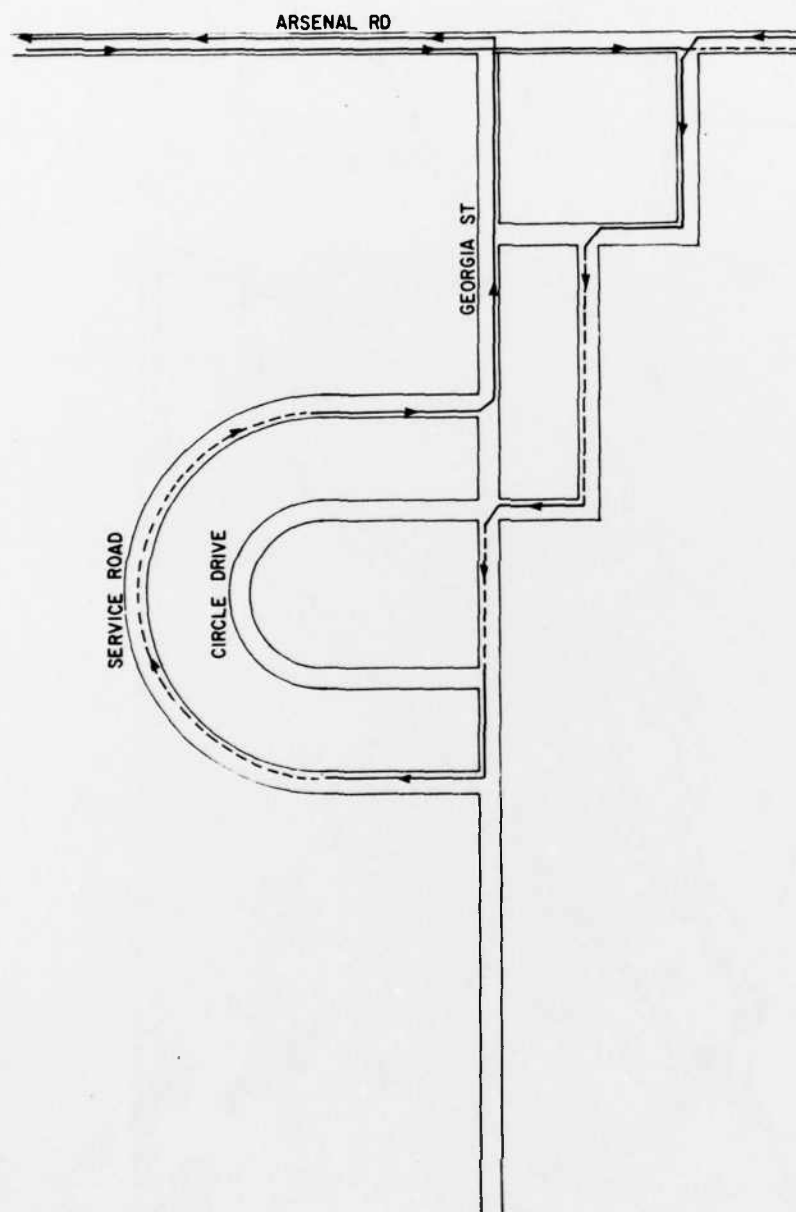
HILL AFB, UTAH

ROUTE 3
16 CU YD VEHICLE

TRAVEL

COLLECT BOTH SIDES

COLLECT RIGHT SIDE



HILL AFB, UTAH

ROUTE 3
16 CU YD VEHICLE

TRAVEL
COLLECT BOTH SIDES
COLLECT RIGHT SIDE